

# **TECHNICAL APPENDIX B**

## ***TRANSIT OPERATIONS PLAN***

# **SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA**

## **TRANSIT OPERATIONS PLAN SHUTTLE SYSTEM DEMONSTRATION PHASE**

### **INTRODUCTION**

This report documents the recommended transit operations plan for the demonstration phase of the Santa Monica Mountains National Recreation Area (SMMNRA) shuttle bus system. It builds on the work performed in the 2000 Transportation study for the SMMNRA and includes some suggestions for expansion from the demonstration phase to a more permanent system.

The underlying premise that serves as the basis for the recommendations that follow is that a one-year demonstration will be undertaken, with operations confined to weekends and major holidays. Periodic surveys of riders (and possibly non-rider park users) will be taken to determine the level of satisfaction with the existing service. Modifications to routes and schedules may be undertaken if survey responses suggest doing so would significantly increase satisfaction and/or utilization.

Topics included in the Transit Operations Plan are:

- Route and timing plan
- Connections to regional, local transit services
- System capacity
- Financial operation
- Marketing strategy
- Ridership goals and performance measures
- Vehicle selection and equipment
- System infrastructure

### **ROUTE AND TIMING PLAN**

The demonstration route is essentially as depicted in the 2000 Transportation Plan (Figure 5.1.1-7) as the “Heart of the Park Shuttle Route”. It begins at Malibu Creek State Park and operates in a clockwise direction on a loop via Malibu Canyon Road, Pacific Coast Highway (PCH), Cross Creek Road, Civic Center Way, Pacific Coast Highway (PCH), Corral Canyon Road to and from Solstice Canyon, PCH, Westward Beach Road, PCH, Kanan Dume Road, Mulholland Highway, Cornell Road to/from Paramount Ranch, returning to the starting point via Mulholland and Malibu Canyon Road. The loop also operates counter-clockwise, generally traversing the same roads in the opposite sequence and direction.

Passenger stops are planned at Malibu Creek State Park, Tapia Park, Pepperdine University, Malibu Lagoon, Cross Creek Road, Civic Center Way (for connection with Los Angeles Metropolitan Transit Authority [MTA] service), Solstice Canyon, Westward Beach (two stops – near Zuma Beach and near Westward Beach), Backbone trailhead at Kanan Dume Road, Rocky Oaks, Peter Strauss Ranch, and Paramount Ranch. In addition, flag stops (no passenger pickup/dropoffs allowed) are recommended on the clockwise route at existing scenic overlook points on Mulholland Highway and Kanan Road, and on the counterclockwise route on Malibu

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Canyon Road. These stops are chosen so the buses can exit/egress without having to cross the opposing-direction traffic lane.

A separate report provides details on amenities and facilities to be provided at each stop. Minor stops may require nothing beyond a bus stop sign and a bench; major stops will include park and ride facilities, overhead canopies, public restroom facilities, information kiosks, additional pedestrian area paving, and landscaping. Major stops are generally located close to existing rest room facilities.

Service frequency is hourly in each direction. Running time is scheduled at approximately one hour 48 minutes, allowing for a reasonable amount of recovery/break time at Malibu Creek State Park between trips, while permitting the shuttles to operate on “clock headways” (i.e., at the same time every hour).

An analysis of waiting times was performed to estimate the time saving that might be realized by visitors if the shuttle departure times from Malibu Creek State Park were offset so that a visitor returning from Zuma Lagoon or another point approximately half-way around the route would find buses going in opposite directions departing about a half-hour apart rather than arriving simultaneously. This analysis was further refined to determine the offset needed to minimize the sum of waiting time and travel time incurred by a passenger arriving at the shuttle stop at a random time and boarding the first shuttle that arrives, regardless of direction of travel. The optimal offset varies according to origin/destination pair, and can be achieved for the Malibu Creek-Zuma Lagoon trip by scheduling departures of the clockwise route 23 minutes ahead of departures of the counter-clockwise route. Note that not all destinations can benefit from this offset; some will inevitably be worse off than if both directions left Malibu Creek simultaneously. As actual ridership data accumulates, a determination can be made as to the offset that would maximize overall time saving, given the relative popularity of various origin-destination pairs.

The basic (year-round) service day has the first clockwise trip departing Malibu Creek at approximately 9 a.m. (times for the counter-clockwise route are 23 minutes later due to the offset) and the last trip departing at 4 p.m., so that the last bus is off the route by approximately 6 p.m. During spring and summer months (essentially coincident with Daylight Savings Time) the service day is extended three hours more, so that the last trips leave Malibu Creek State Park around 7 p.m., and finish their runs around 9 p.m. Concern has been expressed over the alternatives confronting visitors who miss the last bus, regardless of when service is scheduled to end. One solution under consideration is to post a telephone number for visitor use in emergencies at the shuttle stops. The posted number could be connected with a mobile telephone assigned to the National Park Service (NPS) employee responsible for overseeing the shuttle service, providing on-call service for connections with the MTA, and so on. This employee could be authorized to assist stranded passengers who missed the last bus. Appropriate procedures to prevent abuse of this service would have to be implemented.

## **CONNECTIONS TO REGIONAL, LOCAL TRANSIT SERVICES**

### **MTA Connections**

The primary transit services that might serve to link the Park Shuttle with the rest of the metropolitan area are MTA routes 434 and 161. Route 434 operates between Malibu, Santa Monica, and the West Los Angeles Transit Center. It is predominantly a reverse-commute

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service, carrying laborers from Los Angeles to Malibu. Weekdays, the bulk of the morning service trips are westbound, with headways as low as eight minutes. In addition to the trips that originate in West Los Angeles, through service originates at Union Station operating on Venice Boulevard, with limited stops en route to West Los Angeles, and short turns which also originate at Venice Boulevard and Vermont Avenue. Eastbound service during the weekday morning peak hours is confined to one trip per hour from Malibu, and all morning trips terminate at the West Los Angeles Transit Center.

Saturday Route 434 service shows the same out-commute pattern, with 15 westbound trips departing West Los Angeles between 5:40 a.m. and 9:00 a.m., half of which originate at Union Station and the rest at Venice and Vermont. Hourly eastbound service begins in Malibu at 7:00 a.m. and only goes beyond West Los Angeles to Union Station in the late afternoon and evening hours. Running time from West Los Angeles to Malibu Canyon and Civic Center in the early afternoon is scheduled at 46 minutes. The trip from Union Station to West Los Angeles via the Route 439 express requires an additional 35 minutes.

Sunday service to Malibu is roughly half-hourly from West Los Angeles on an uneven headway, to about 2 p.m., after which service is every 30-40 minutes through the afternoon and hourly in the early evening. Eastbound from Malibu, service leaves on the hour between 7 a.m. and 3 p.m., then half-hourly until 6 p.m., and hourly until the last bus at 9:05 p.m. Sunday running times are a bit faster than Saturdays.

Route 434 traverses the Pacific Coast Highway from Santa Monica to Malibu, except for a short detour to Malibu Canyon and Civic Center Drive, which functions as a mini-hub for MTA in Malibu. The route thus operates on essentially the same alignment planned for the shuttle in the area between Malibu Lagoon State Beach and Zuma Beach. Further, the Route 434 bus provides good linkage between locations close to the Santa Monica Pier, including several tourist hotels, and the Park attractions along PCH in Malibu.

The MTA has no problem with sharing its stop stations with other carriers, so there would be several potential transfer locations along PCH for access to inland destinations along the Park Shuttle route. However, due to the complex MTA scheduling process and the frequency of their schedule changes, schedule coordination would likely be a matter of NPS working around MTA schedules. Although the technical means for real-time coordination of transfers for intending passengers probably exists, MTA staff have indicated that the real-world barriers to consistently providing that kind of service are formidable and may not result in better service for transferring passengers than could be achieved by basic schedule coordination.

During the demonstration period, an effort should be made to provide a connection in the Malibu area whereby, from the start of the shuttle service day to roughly 2 p.m., the shuttle leaves a common stop within five or ten minutes after the Route 434 westbound bus is scheduled to arrive. For the remainder of the service day, if possible, the shuttle should be scheduled to arrive within five or ten minutes before the Route 434 eastbound bus is scheduled to leave the common stop. However, should the Route 434 schedule change during the demonstration period, it may not be practical to modify the shuttle schedule to match. Schedule postings at individual stops would all have to be changed, and there is some risk of alienating frequent visitors who may have become accustomed to the shuttle's hourly schedule, regardless of their mode of access to the shuttle. Results from the initial period of coordinated operation should be evaluated to determine if the convenience to visitors arriving via Route 434 is likely to outweigh the inconvenience to others.

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Route 161 operates between Westlake Village and Canoga Park through Agoura Hills, Calabasas, and Woodland Hills. It also provides more service outbound (to Westlake Village) in morning peak hours than to Canoga Park. Service only continues from Woodland Hills to Canoga Park weekdays. On weekends it terminates at Ventura Boulevard and Topanga Canyon Drive. Running time to Kanan and the Ventura Freeway (Highway 101) from Ventura and Topanga Canyon is scheduled for 26-28 minutes with hourly service provided during shuttle operating hours on Saturdays and Sundays. It is not clear what demand there would be for access to the SMMNRA from the territory served by Route 161. Nor is the “Heart of the Park” Shuttle planned to operate to any point along Route 161 during the demonstration phase. Discussions with other transit operators in the Calabasas-Agoura Hills-Westlake-Thousand Oaks area should be pursued to determine if there is any possibility that one (or more) of them might undertake to provide either demand-responsive or scheduled weekend service between an appropriate stop along Route 161, and either Paramount Ranch or Malibu Creek State Park at a minimum, or all the way to PCH, possibly in conjunction with other “beach bus” service. Initial discussions between NPS and City of Calabasas staff members indicate a strong interest in providing weekend service that would link areas in Calabasas and Route 161 with Malibu Creek State Park. Ideally, such a service would be timed to connect with the Park Shuttle.

### **Community Shuttle**

Operation of the “Community Shuttle” recommended in the 2000 Transportation Plan is not recommended as part of the demonstration program. Operating the Community Shuttle would require scheduling another bus to maintain the hourly schedule for the “Heart of the Park” Shuttle, but either the Community Shuttle bus would only be running for a small fraction of the hour, or it would be undertaking to serve a relatively large area outside the park boundaries. Instead, as indicated above, the possibility of linking MTA Route 161 and community centers to the “Heart of the Park” Shuttle route should be pursued with Calabasas and other US 101 (Ventura Freeway) communities. The objective would be to achieve some degree of service coordination without NPS having to bear the cost of providing service beyond Park boundaries.

### **Runner Van**

As an alternative, it may be possible to facilitate the linkage in another way. Consideration should be given to providing a multi-purpose vehicle (“runner van”) to be operated by an NPS staff member assigned responsibility for overseeing the shuttle operation. The runner van would be available for several uses:

- To operate in a demand-response mode (to telephone requests made to a published cell phone). The assigned staff member would carry shuttle users between Malibu Creek State Park and the Route 161 stop at the US 101 (Ventura Freeway) and Las Virgenes Road.
- To carry loads of bicycles or other recreational items when demand exceeds the capacity of the shuttle buses. (Hypothetically, a trailer could be used for this purpose, but trailers cannot legally be operated on Kanan Road per Los Angeles County restrictions).
- To provide for a nominal amount of added passenger capacity in overload situations.
- To allow the responsible NPS staff member to monitor shuttle service over the entire route, check for proper fare payment at random stops, assist in emergency situations, and so on.

## **SYSTEM CAPACITY**

### **Total Ridership Capacity**

System capacity at any given moment should be limited to the number of seats available on the vehicles in service. Allowing passengers to stand is not recommended, given the sharp curves and grade changes en route. Thus, if mini-buses seating 20 passengers are used in the service, the instantaneous capacity would be 80 passengers, with four mini-buses in service. However, given the probability of multiple boardings and alightings en route, a single bus might easily experience (and accommodate) a turnover factor of 2 or 3 per trip. This would imply that each bus carried 40-60 passengers in the course of one two-hour trip around the circuit, so that the total hourly capacity of the system with four buses in service would be 80-120 passengers per hour. This translates to a daily capacity of 880-1,320 riders per day during spring and summer, and 640-960 passengers per day during autumn and winter. On an annual basis, the system would have the capacity to accommodate 82,000-123,000 users. The capacity is substantially greater than the projected demand. This is a result of the type of vehicle recommended – a heavy-duty, long-life unit not generally available in lower-capacity, smaller size.

The 2000 Transportation Study for SMMNRA proposed a fare-free, one-year demonstration and projected ridership at 30,600 for a system quite comparable to the one recommended here. The ridership projection was based on responses from a visitor survey at a number of park sites about the likelihood that the respondent would use the shuttle system. Using a fare elasticity factor of 1/3 for the effect of charging a fare, based on work reported in the Transportation Research Board handbook on “Traveler Response to Transportation System Changes,” ridership on the recommended system is estimated at 23,500 to 30,500 for the first year, depending on the value selected for the influence of system coverage (influence of number of available destinations on visitors’ decision to use the system).

### **Monitoring Capacity/Utilization**

Two types of monitoring are recommended. The first is primarily used to establish the pattern of demand over the course of the demonstration program. At the most basic level, it would consist of a daily trip sheet per bus. The bus operator would record the number of visitors boarding and alighting at each stop on each trip, along with general weather conditions and any unusual events, such as festivals at Paramount Ranch. The information on the sheet would be input to a spreadsheet program following the end of service for the day. Over time, profiles of ridership by time of day, day of week, and level of stop activity would be developed.

The second type of monitoring is more complicated, but ideally could be used to adjust capacity in real time. The bus operator would use the vehicle’s two-way radio (or a cellular phone, if coverage is adequate all along the route) to report overloads to a dispatcher, who could instruct other operators to adjust their departure times to minimize waiting time for passengers not accommodated, or possibly even dispatch an additional vehicle to carry the added load. In any event, the operator should record on a separate report form passengers not accommodated, with entries indicating the stop, the time, and the number of passengers left behind.

At a slightly higher level of detail, a bus operator who boards a large group of passengers could attempt to ascertain the desired time of the return trip and inform the dispatcher, who could dispatch an extra vehicle to handle the group if the overall demand level for the day appeared high enough that some of the group would likely have to be left behind on the return trip for lack

of adequate capacity. The “runner van” is another potential resource for accommodating an overload. The ability to predict demand by trip will be minimal at the start of the demonstration project but should grow as the data base expands.

## **FINANCIAL OPERATION**

### **Fare Structure**

A number of issues must be considered in establishing the level and structure of fares. Among other things, the fare *level* should be set so that it:

- recovers a reasonable portion of operating cost
- is not so high as to pose a substantial barrier to system use, particularly by low-income individuals or large families

Although it was originally thought that the demonstration project should be fare-free to maximize ridership, the focus groups established a significant amount of support for charging a reasonable fare. The suggested fare was two dollars for a single ride and five dollars for an all-day pass. However, differences in the amount of support for those fare levels between focus groups could be interpreted as an effort on the part of current park users to protect the park assets from over-use, although the second focus group (a broader cross-section of area residents) was also relatively comfortable with the recommended fare structure.

The fare structure should be designed to:

- minimize the number of transactions required of the bus operator
- be easy to collect and to audit

A *day-pass* (or even a pass with a longer validity period, e.g., three months) would help minimize the number of transactions required. Advance mail order sales of longer-period passes would also help, by minimizing on-vehicle sales transactions. However, such an arrangement would require the concessionaire or a third-party vendor to process the transactions. Since transactions have a cost, this type of arrangement would result in either reduced net revenue to NPS or a higher cost to the rider. Pricing the daily pass at more than twice the one-way one-ride fare is likely to result in minimal pass sales, since a visitor only realizes a cost saving if using the bus more than twice during the day. If the desire is to stimulate pass sales and reduce on-vehicle transactions, the day pass should be priced slightly lower than two single rides.

*Family fares* are a way to keep the cost of shuttle use within reason for a family. Among the ways to accomplish this are:

- allowing up to two children, say under age 12, or less than a certain height, to ride free, per adult fare collected
- charging no fare, or a reduced fare, for children under a certain age (age 10, for example)
- allowing a family group (possibly capped at 6 persons, for example) to ride for no more than twice the daily pass price.

For the sake of simplicity, and to avoid involving the vehicle operator in determinations of age or family status, it is recommended that children less than 49 inches tall be allowed to ride free, and that a full fare be charged all passengers 49 inches tall or taller. The fare structure recommended is simply two dollars per trip or five dollars for a day pass. A two-trip fare instrument could be sold for four dollars to reduce the number of fare transactions. The day pass will be attractive to park visitors who want to sample more than one site; the single fare would enable a visitor to ride

to a trailhead and hike back to their origin, and the two-trip fare instrument would facilitate a trip from, say, parking at Paramount Ranch to one of the beaches and return, or a trip to one trailhead followed by a bicycle ride to another trailhead and a shuttle return to the starting point.

*Promotional fares* should be offered to stimulate riding and introduce visitors to the service. Operating the service fare-free for the initial weekend is a common tradition in the transit industry. Aside from that, rather than beginning service with a low fare and increasing it after an initial period (for example, the first three months), it is recommended that the fare structure described above be implemented as soon as fares are charged, but that discount coupons be made readily available. One excellent coupon distribution possibility would be to insert a coupon as part of a shuttle service advertisement in the quarterly “Outdoors” calendar produced by SMMNRA, which is distributed by bulk mail and is also available at Park sites. Including the coupons in local newspapers is another possibility, as is inclusion in welcome gift packages for new residents. Discounts could offer, for example, one free ride or a two to three dollar discount on a day pass, or a “kids ride free with an adult” deal.

### **Collection and Recovery**

Multiple and sometimes conflicting objectives affect the choice of fare collection and recovery procedures. Among key objectives are:

- maximizing convenience to passengers, by accepting cash or credit/debit card, by making change, and by having a simple and easily-understood fare structure
- minimizing the workload for the vehicle operator
- maximizing the security of the collected revenues

A variety of manual, mechanical, and electronic ticketing and fare collection devices are marketed, ranging from a simple locked-vault coin-only farebox to a highly sophisticated electronic ticket-issuing, fare-registering machine which can be set by the operator to vend a number of different types of fare instruments. For the demonstration program, it appears appropriate to accept only cash fares, and to rely on an operator-issued, manually-punched, two-part cash fare receipt. Such receipts are typically used for occasional cash fare collection on commuter rail services (and were formerly used on some suburban bus routes). The operator collects the appropriate fare and punches both parts of the receipt simultaneously, giving one to the passenger and retaining the other. The receipt is punched to indicate the date of sale, the type of fare paid, and the amount collected. Depending on the fare structure selected, fare types might include single-trip, round trip, and day pass for an individual or a family group. The passenger retains the receipt as proof of fare payment, while the Park Service employee occasionally boards the shuttles to verify that each passenger has paid a fare.

The operator must account for and turn in the total of fares punched on his/her part of the fare receipts issued each day. If the amount of cash collected by each operator grows so large as to become a security risk, the operator(s) could make a periodic drop into a safe located at the layover stop. The safe would then be emptied and the money deposited at the end of each operating day. The operating firm might be obliged to (1) turn all receipts and revenues over to NPS, or (2) might optionally be allowed to keep the revenue and simply enter a credit to NPS for the amount received as an offset against amounts due the contractor under the contractual arrangement. If the contractor simply deposits the revenue and credits NPS, there are fewer opportunities for shrinkage, and the contractor bears the risk of loss due to theft or other mishap. However, with (2), NPS might need to be more involved in auditing the receipts than if the entire daily revenue were immediately deposited to an NPS account. Audits might involve frequent

checks by the responsible Park Service staff member to confirm that all passengers have a valid pass or fare receipt. These audits could serve to validate total incoming revenues.

### **Projected Operating Costs**

Categories of shuttle operating costs for a one-year demonstration period have been identified and estimated. They are based on the assumption that an operations contract will be executed under which the contractor is entirely responsible for vehicle operation, daily servicing and storage, and maintenance. At this stage of project development, considerable uncertainty remains about the source and net cost to NPS for the vehicles to be used in the service. These vehicle costs have not been included in overall operating costs because of the uncertainty, although an upper limit may be estimated at \$30,000 per vehicle per year and the lower limit might be zero. The basis for the range is described in Appendix C.

The three main categories of operating and maintenance cost estimated herein are:

- Bus operations and maintenance
- Administrative costs
- Miscellaneous direct costs

Bus operations and maintenance. Expenses in this category include vehicle operator labor; maintenance labor; servicing labor (fueling, washing, interior cleaning and related daily service checks); cost of fuel, lubricants, tires, and other consumables; revenue handling and accounting; and general administrative functions. These costs are assumed to be comparable to those experienced by local operators of demand-response transit, which typically uses cutaway vans or small buses. An average of representative local operators' costs was derived, and a rate of \$43 per bus-hour established.

Administrative costs. NPS control of the "Heart of the Park" Shuttle service will result in some administrative costs. An NPS employee should be assigned responsibility for overseeing the service whenever it is in operation. Duties of this assignment would include:

- Providing information on the shuttle service to individuals and directing the marketing of the service.
- Monitoring on-time operation and summarizing passenger counts provided by the contractor.
- Checking shuttle passengers for proof of fare payment.
- Reconciling revenue reports with passenger counts.
- Generally monitoring contractor performance, approving invoices, and serving as liaison with the contractor's contract manager to address issues of mutual concern.
- Inspecting condition of shuttle stop areas for cleanliness and reporting needed maintenance to the individual site managers.
- Providing on-call service to connect with the MTA Route 161 service, using a Park Service vehicle.
- Providing overflow carrying capacity to augment the shuttle under exceptional demands, using a Park Service vehicle.
- Transporting bicycles and other recreational gear, if demand exceeds capacity of the buses, using a Park Service vehicle.

Ideally, an NPS employee with the above responsibilities would be on duty during all hours the service operates. This would involve 55 12-hour days during the six peak months and 52 off-peak 9-hour days. Additionally, it is likely that another four hours per week will be needed for

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miscellaneous administrative duties associated with the service, such as coordinating marketing campaigns, reporting on performance, approving invoices, and contractor liaison. In sum, the NPS administrative responsibilities are expected to amount to somewhere between 0.5 and 1.0 Full Time Equivalent (FTE) employee salary and benefits for the demonstration year. An annual cost of \$50,000 has been assumed for this effort.

### **Potential Revenue Sources**

Capital funds will be required for construction of shuttle stops and related amenities and may eventually be required for rolling stock and specialized shop equipment. However, the demonstration program rolling stock, ideally, should be leased, in which case the capital cost of the vehicles and any specialized equipment should either be included in the operating contract, or be the subject of a separate agreement between NPS and the lessor. Nevertheless, NPS will have to secure funding for other capital improvements.

Likewise, operating funds will be needed to cover the contract costs of operation and maintenance of the service. Additionally, for all practical purposes, the portion of the contract cost attributable to rolling stock, if any, should be considered as an operating cost during the demonstration period.

Operating costs may be offset partially by “farebox” revenues, which could pay for between 30% and 50% of operating costs. Although it is conceivable that local businesses might be willing to provide a certain amount of financial support for the demonstration program as a civic contribution, developing that support requires substantial effort. A more productive approach may be to develop a cost-sharing agreement with California State Parks and Los Angeles County, which are most likely to share visitors (and traffic issues) with SMMNRA. Rather than requiring NPS to underwrite the entire projected deficit for the duration of the demonstration program, an agreement with those agencies to share the shortfall between operating expense and farebox revenue would contribute significantly to the success of the demonstration.

The following describes a variety of Federal and State funding programs, as well as various user fee concepts and local partnerships that could help fund the proposed SMMNRA shuttle system. These include (1) Federal Capital Funding (2) Federal Operating Funding (3) State Capital and Operating Assistance and (4) User Fees.

### **Federal Capital Funding**

Federal capital funding is authorized for transportation projects through the Transportation Efficiency Act (Act) of the 21<sup>st</sup> Century, or TEA-21. The Act covers a six-year period from 1998 through 2003 and authorizes various, sizeable transportation funding programs. Although reauthorization hearings have begun, details of the new program will not be known until the new bill is enacted, and this is not likely to occur until late in 2003, at best. If new legislation is not enacted by the expiration date of the current legislation, the most likely scenario would be enactment of a continuing resolution, possibly with reduced funding levels, until the new bill is passed. The program descriptions that follow are based on the existing legislation, and may or may not carry over in the new bill.

The National Park Service’s Alternative Transportation Program, which has funded planning, environmental review, and the visitor survey and related tasks, is ultimately funded through TEA-21 by the **Federal Lands Highways Program for Park Roads and Parkways (PRP)**. Funds

are distributed by the Federal Highway Administration (FHWA), and can be applied toward transit projects and planning activities. Vehicle purchases are also eligible as a capital expense, reflecting the fact that transit vehicles are major purchases that often remain in service for several years or more. TEA-21 authorizes the use of NPS-appropriated PRP funds as contribution toward the 20% “local/state” match that other Federal transportation programs require.

The Federal Highway Administration (FHWA) sponsors the largest allocation of TEA-21 money, called the **Surface Transportation Program (STP)**, whose funds may be applied toward transit and highway capital projects. These funds are distributed through States – which means that NPS would need to apply to the California Department of Transportation to receive these Federal funds. The program also requires a 20% local/state match; however, for projects that cross parklands, such as the SMMNRA, TEA-21 authorizes the PRP to be used as the “local match”. Essentially, TEA-21 makes it possible for 100% Federal funding to pay for capital expenses associated with the proposed shuttle system – up to 20% of which could be comprised of NPS-appropriated PRP funds.

Importantly, a 10% portion of each state’s apportioned STP funds are set aside specifically for “**Transportation Enhancements**” – improvements that strengthen aesthetic, environmental, or cultural aspects of the nation’s transportation system. For example, Transportation Enhancements funds could be applied toward the landscaping of shuttle stops or the contextually sensitive design of waiting areas. The State of California may have additional eligibility and selection criteria.

Another potential Federal funding source sponsored by FHWA is the **Congestion Mitigation & Air Quality Improvement Program (CMAQ)**, whose funds can be used in EPA-designated air quality non-attainment and maintenance areas to fund transportation projects that would improve air quality. The Los Angeles Basin is one such area, and the NPS shuttle system therefore could qualify for CMAQ funds, since it would improve air quality by reducing automobile traffic and because it would use alternative fuel vehicles. Like STP funds, CMAQ funds are administered through the State. Projects can be identified through the statewide transportation planning process or through a discretionary grant program. CMAQ likewise requires a 20% state/local match, which NPS again may contribute toward, with its appropriated PRP funds.

Finally, the Federal Transit Administration (FTA) sponsors two Federal funding programs that the proposed shuttle system could use. Unlike FHWA programs, NPS may acquire FTA funds only as a sub-recipient – through another transit provider or public agency. Also, NPS may not contribute its appropriated PRP funds to the required state/local match for FTA grants. However, FTA funding may be easier to qualify for, and the FTA-sponsored Federal share could be higher than 80% in some cases.

FTA’s **Urbanized Area Formula Transit Grant**, which is the second largest allocation of Federal transportation money, is the transit counterpart to FHWA’s Surface Transportation Program, and can be used for nearly any transit capital investment, including vehicles, stops and other facilities. The grant is allocated to urban areas and will provide 80% funding for most projects, but 95% funding for projects that provide bicycle access to mass transit. NPS’s proposed shuttle system probably would be eligible for the 95% Federal funding category. It should be noted, however, that the full amount of funds available to an urbanized area under this program is typically allocated to recipient agencies through the process of preparing the Transportation Improvement Program, and it may not be possible to accommodate a request for funding a new project on short notice. Thus, this source would more likely be available for a

permanent service in subsequent years than for the demonstration period that should begin in a relatively short time.<sup>1</sup>

If the rolling stock is purchased by a unit of local government, specialized funds for clean-fuel vehicles may be available. The FTA-sponsored **Clean Fuels Formula Grant Program** can be applied toward projects that use or accommodate the use of low-emission or clean-fuel transit vehicles. For example, Clean Fuel funds could be used to purchase low-emissions buses or build alternative-fueling facilities or garages. Compressed natural gas, which is proposed for the shuttle system, qualifies as an eligible technology. The Clean Fuels program authorizes FTA to fund 80% of eligible capital costs and requires a 20% local/state match.

### **Federal Operating Funding**

Over the past decade, the Federal government has pursued a policy of funding less operating expenses. As a result, most operating assistance originates from state and local sources. However, FTA does make available some funds through its Urbanized Area Formula Transit Grant (discussed earlier) for preventative maintenance – a category that would count as an operating expense on NPS’s ledger. Also, if the SMMNRA qualifies as a non-urbanized area, the shuttle system would qualify for operating assistance through this Grant.

### **State Capital and Operating Assistance**

The State of California provides two dedicated sources of transit funding, though only one of these is available for operators in the Los Angeles/Ventura County area. The applicable source, called the **State Transit Assistance (STA)** program, is derived entirely from state sales taxes on gas and diesel fuel. The State allocates STA funds directly to transit operators, based on the share of their revenues as a proportion of all transit revenues collected by fund recipients in the State. After two years of operation, an operator must maintain a farebox recovery ratio of no less than 20% to continue receiving funding, though if the SMMNRA qualifies as a non-urbanized area according to the 2000 U.S. Census (designations will be published in early April 2002), then the operator must maintain a farebox recovery ratio of no less than 10% after two years. Since NPS does not meet the State’s definition of an eligible “claimant or operator”,<sup>1</sup> NPS would have to be a sub-recipient of a qualified operator, to receive any funding through the State’s program.

### **User Fees**

The Department of Interior and Related Agencies Appropriations Act of 1999 authorizes NPS to charge fees and apply the revenues toward improving park transportation systems and services. These fees can be charged in addition to entrance fees and may be bundled together with entrance fees for a one-time collection from park visitors. Bus fares are an obvious type of user fee; NPS also may wish to consider other types of fees, either in lieu of, or in addition to, fares.

In coordination with California State Parks and Los Angeles County, NPS could charge **park entrance fees** at major entry points. This practice has been implemented successfully at numerous National Parks and Recreation Areas across the country. In some Parks, fees are charged only at the more popular entrances or during peak seasons. Where entrance volumes are not high enough to warrant a Park Service ranger, the “honor system” also works for collecting fees. Or, NPS could charge **parking fees** at popular parking locations.

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<sup>1</sup> See Sections 99203 and 99210 of the California Public Utilities Code

Nominal fees could generate more than enough revenue for the shuttle system. For example, the portion of the Recreation Area that will be served by the shuttle hosts 1.34 million visitors annually, including 550,000 on weekends. Assuming visitors average 2.5 persons per car, charging a nominal two dollar entry fee per vehicle could generate \$1.1 million annually, or \$440,000 if charged just on weekends – amounts much greater than costs of operating the proposed shuttle system. Formal cost estimates for shuttle system operation are forthcoming.

Of course, the administration of any fees would need to be coordinated closely with California State Parks and Los Angeles County, which oversee large portions of the Recreation Area and already charge parking fees at some sites. Since these entities already would be prime candidates for sharing the expense of the Visitor Transportation System with NPS, their potential partnership in jointly administering and sharing the revenues of a nominal fee system should be considered.

Paying for the system with entry or parking fees also would allow NPS to allow park visitors to make use of the shuttle system without a charge, thereby reducing the marginal cost of use to zero for all visitors, greatly encouraging ridership. Based on studies of fare elasticity in numerous other settings, the study team estimates that *not* charging a fare would increase ridership by about 50% and thereby increase the shuttle system's effectiveness commensurately.

## **MARKETING STRATEGY**

### **Target Segments**

The focus groups and public meetings identified two distinct market segments: frequent park users, many of whom live relatively close to the SMMNRA, and non- or infrequent users, who are somewhat more widely distributed. Frequent users tend to be more knowledgeable about what the SMMNRA has to offer, less interested in interpretation than in transportation to a specific trailhead or other starting point for a day's outing. They are more likely to be interested in transport to one point and pick up at another point (to enable them to hike or bike a portion of a trail without having to return to the trailhead starting point) than in a round trip narrated tour. The non-user market segment is more likely to be interested in an interpretive tour and possibly (though this needs more research) more likely to want to access the Park by public transportation given the availability of a shuttle service within the SMMNRA. This segment is also seen as more likely to want to "sample" several SMMNRA sites in a single visit, with sightseeing or brief hikes at a number of locations. The shuttle service would be an ideal way for such visitors to get around the area without having to worry about driving or parking.

### **Marketing Activities**

Marketing to frequent users may concentrate on outreach through affinity groups such as cyclist organizations, the Sierra Club, and periodic publicity materials published for SMMNRA by NPS and distributed at Park Headquarters and other Park venues. Shuttle stop design and informative materials (e.g. schedules, maps) at the stops are also a significant part of the marketing effort.

Outreach to non-users should concentrate on the general population within a given radius of the SMMNRA. The bulk mailing of "Outdoors", mentioned above, is an excellent medium to publicize the shuttle service. An article, with shuttle route map and schedule, and a discount coupon as well, should generate considerable awareness among area residents. Placement of stories about the service in newspapers with local community circulation, and flyers to neighborhood associations with a request to distribute to memberships and a return postcard to

request more copies should be sought within the month before service begins, with a follow-up after the service has been in operation for two or three months. Local government offices (i.e., city halls) may be willing to post information about the service. Local radio stations can also be an effective way to “spread the word.”

## **RIDERSHIP GOALS AND PERFORMANCE MEASURES**

### **Ridership Goals**

Ridership for a new system is typically tracked in terms of raw numbers of boardings, regardless of whether, e.g., 100 individuals board once each during a service day or 50 individuals each board twice. If ten trips are operated in each direction during the service day, using 20-passenger buses, but ignoring turnover of seats during a trip, system capacity would be 400 riders.

Ridership stabilizing at 25% of capacity would be a reasonable target, and 80% of target should be an intermediate (after six months) goal. This would imply 80 riders per day after six months of operation, and 100 riders per day by the end of the demonstration period

## **VEHICLE SELECTION AND EQUIPMENT**

### **Lease vs. Purchase**

The vehicles to be used in the demonstration program must be attractive and of high quality to give the program the best possible opportunity to succeed. A stand-alone fleet of five vehicles would be needed, and a budget of \$80,000 to \$160,000 per unit is not an unreasonable amount. Should the vehicles need to be disposed of at the end of the demonstration period, an established transit operator would have an opportunity to integrate the fleet with the rest of his/her operation. The Park Service, on the other hand, would be at the mercy of whatever used bus dealer chose to bid on what is admittedly a specialty vehicle with limited application. Thus, it would be difficult to justify investing Park Service funds in a fleet given the inherent uncertainties in the program at the present time. A lease arrangement will minimize the financial outlay required of the Park Service during the demonstration period.

### **Specialized Features**

Critical vehicle features for the shuttle application include the following:

- Good ride quality. A mini-bus on a standard steel-spring truck chassis is not likely to have acceptable ride quality. A purpose-built chassis with air suspension springing and oversize shock absorbers is more likely to be acceptable.
- Ultra-low emissions. Note that the vehicle specification should call for a vehicle that meets the specification but not necessarily the type of fuel to be used. It may be more difficult to procure a compressed natural gas (CNG-engined) vehicle that has adequate power for the loads and grades anticipated than to procure a “clean diesel” vehicle.
- High performance. The vehicles must be capable of operating on the critical grades between Malibu and Paramount Ranch, fully loaded, without delaying following traffic or overheating on a maximum-temperature day. Kanan Road is posted as having an 8% grade. Oversize engine and cooling system should be specified.

Desirable vehicle features include:

- Unique exterior paint or wrap scheme. It would be highly desirable to have a “different” vehicle appearance to identify the service. However, if vehicles are shared with (or in effect leased from) another transit operation, it may be necessary to settle for magnetic

## *Transit Operations Plan*

signs that will adhere to the vehicle side but be quickly removable when used in the other service.

- Air conditioning. Given the variation in temperature often encountered between the coast and the inland areas, particularly in the summer, air conditioning is a necessity. Openable side windows with adequate protection to prevent passengers from putting heads or limbs outside the vehicle, plus roof vents, should also be specified. These will be used on days of less extreme temperature as well as providing some relief in case of failure of the air conditioning system en route. Note that an adequate air conditioning system will require even more engine power and will adversely affect fuel economy.
- Public address system. Depending on the type of interpretation selected, the system might include a playback device for recorded narration to be triggered by the vehicle operator at appropriate locations, or simply an on-board amplification system.
- Bicycle racks. Bike racks installed front and rear of the vehicle would accommodate a maximum of four bikes at a time. If more bikes must be carried on a single trip, at least three options are available: 1) Instead of the racks, design special trailers to carry bicycles. The trailers would hitch behind the buses, and could either be left coupled up for the entire service period, or made available “by prior request” only. The latter would be preferable in terms of vehicle performance and ride characteristics but less convenient to the public. However, since a need to accommodate more than four bikes on a trip is likely to be associated with a pre-planned trail ride by an organized group, the inconvenience of the advance request should be minimal. Note, however, that trailers are prohibited by Los Angeles County on Kanan Road, which may make this suggestion unworkable. The trailer would have to be kept on the eastern half of the route, necessitating its transfer from one shuttle to the other at a meeting point. This does not appear to be practical for several reasons. 2) Reduce interior seating or install fold-up seats to allow more bikes to be carried inside the vehicle as well as on exterior racks. This may result in some inconvenience to passengers and will reduce vehicle capacity, particularly if the recommended “No Standees” rule is enforced. 3) Arrange for a Park Service or contractor-operated vehicle to transport groups of bicycles on prior request. This service could be provided using a vehicle no more elaborate than a standard pickup truck, and a charge for the service would definitely be justifiable.

Vehicle features suggested by focus group members but definitely not recommended include:

- Sightseeing roofs. Glass panels in the vehicle roof provide a better view of hillsides and other features of interest, but introduce an additional heat load inside the vehicle and have historically proved leak-prone in rainy weather. Much of the view can be provided by larger side windows, which are more likely to be available on a mini-bus than a cutaway.
- Refreshments provided on board. A servicing and maintenance headache, not to mention an expense and potential liability.
- Restrooms on board. Not needed, given that major stop locations are generally near existing rest rooms. Not practical for installation on minibuses in any case.

### **Vans vs. Minibuses: Life Cycle Costs vs. Fleet Size**

Although it is highly speculative, some generalizations about relative costs can be drawn from transit industry experience. A detailed evaluation of vans vs. buses on an economic basis, however, depends on the actual vehicles selected and the nature of the contract operation. For all practical purposes, useful life of a van is limited to three or four years in daily service. A 15-passenger “maxi-van” should only be expected to carry 12 passengers, when allowance is made for picnic baskets and recreational equipment that park visitors might reasonably be expected to

carry. The type of minibus recommended would have a life expectancy of at least seven and possibly ten years. A van could provide 12 x 3.5, or 42 “seat-years” of capacity in its lifetime, while the minibus would provide at least 20 x 7, or 140 “seat-years” of capacity. Other things being equal, if the bus cost three times as much as the van, the capital cost per unit of capacity for the bus would still be slightly less than for the van. Operator cost for the van would be somewhat lower than for the bus, but probably not proportionally less relative to productivity (passengers per operator). Fuel, servicing, and maintenance cost per van would be noticeably lower than per bus, but these costs are typically 30-40% of total operating and maintenance costs. Again, a detailed comparison depends on the specific make and model of vehicle selected. It is almost without exception the experience in bus transit operations that the cost *per unit of capacity* is smaller, the larger the vehicle.

However, the cost per passenger *actually carried* may not be lower for a larger vehicle, depending on demand vs. capacity. As a practical matter, however, it is not likely to prove workable to schedule operators of extra vehicles in advance, given the expected unpredictability of demand for the service over the length of the working day. Nor is it usually possible to bring extra operators on duty on short notice, particularly on weekend shifts, without paying them for standby time, which reduces if not eliminates the potential cost saving.

Capacity considerations aside, there are some non-economic reasons to prefer minibuses to vans:

- Minibuses are much easier to board and alight from. Headroom (in an “unconverted” van) is inadequate to allow most adults to enter standing up, and the “15-passenger” capacity is achieved at the expense of adequate passageway width for access to the rear seats.
- Though it may be possible to fit out maxi-vans with bike racks, the racks may have to be on the roof to retain access to the rear compartment (for limited visitor belongings storage). This, along with the awkward entry/exit situation, could significantly lengthen stop dwell times, possibly to the point that the two-hour round trip time could not be maintained consistently.
- Passengers prefer a generous “personal space envelope” when riding with strangers, and minibuses allow much more space per passenger. They also have more floor space and the possibility of under-seat storage of personal belongings.

## **SYSTEM INFRASTRUCTURE**

### **Enhanced Park and Ride Facilities**

Park and Ride facilities design is covered with the site plans. Parking space at Paramount Ranch and Malibu Creek State Park appears adequate to accommodate anticipated demand, except for the large special event weekends at Paramount Ranch, which currently occur one to three days a year. For major event days, it would be advisable to coordinate with the event sponsors to ascertain if the shuttles can be provided free-flowing access/egress from the site to avoid schedule delays. In this case, it might even be possible for the shuttle to serve visitors to Paramount Ranch who find it convenient or necessary to park in remote lots and shuttle in to the event. If a mutually beneficial arrangement cannot be worked out, it may be necessary for the shuttle to discontinue service to Paramount Ranch on the occasions of their major special events.

Overflow shuttle riders from Paramount and Malibu Creek could presumably be accommodated at Tapia. Discussions may be undertaken with Pepperdine University about weekend use of their student parking lots, which might be attractive for origination of shuttle trips both for around-the-

park touring and for access to Malibu-area attractions where parking is already scarce. The Zuma Beach area is assumed to be a primary destination rather than an origin for shuttle trips, so that there would be no need at Zuma or Westward Beach for park and ride facilities in connection with the shuttle.

### **CNG Fueling Station**

Particularly during the demonstration phase, it would be advisable to make arrangements to fuel CNG-powered vehicles at an existing station rather than incurring the capital cost to provide a complete new facility. The closest CNG stations to the shuttle route are a commercial service station on Las Virgenes Road just south of Highway 101, and the City of Malibu Public Works facility on Civic Center Way. Other local governments or other fleet operators in the area also have fueling stations, although none are as near the shuttle route. Appendix A presents a list of CNG fueling stations in the area. Capital cost of a high-speed CNG fueling station could easily run \$250,000, although some financial assistance may be provided by a local gas supplier or drawn from the Congestion Mitigation and Air Quality Improvement Program (CMAQ) or other federal or state funding programs. (A discussion of financial assistance appears in the Potential Revenue Sources section above.) Ideally, the fueling station should be co-located with or near the point where the vehicles are to be stored and maintained and where drivers report for duty, to avoid added costs for deadheading and/or hostling the fleet.

### **Other Infrastructure Needs**

The concessionaire/contractor providing the service during the demonstration period should bear full responsibility for arranging servicing, storage and maintenance for the fleet. The Park Service should not be expected to make facilities or land available in the SMMNRA for these needs. The concessionaire/contractor should, of course, be permitted to recapture a reasonable amount of return on the marginal cost of the facilities needed for the shuttle service from NPS. Shuttle stop maintenance is assumed to be incorporated in normal park site maintenance operations, using existing staff.

APPENDIX A

CNG FUELING STATIONS IN THE VICINITY OF THE  
“HEART-OF-THE-PARK” SHUTTLE ROUTE

CNG Station Locations									
Index	Distance*	FUEL TYPE	STATION NAME	STREET ADDRESS	CITY	STATE	ZIP	STATION PHONE	TYPE OF ACCESS
<a href="#">1</a>	3.367	CNG	Mac Chevron	4807 Las Virgenes Rd.	Calabasas	CA	91302	818-880-4004	Public access; no restrictions
<a href="#">2</a>	12.306	CNG	LACMTA Chatsworth - Division 8	9201 Canoga Ave.	Chatsworth	CA	91311	No Data	Government Personnel only
<a href="#">3</a>	14.581	CNG	Simi Valley Transit	490 W. Los Angeles	Simi Valley	CA	93065	No Data	Private Station; limited access
<a href="#">4</a>	16.772	CNG	SoCal Gas - Saticoy Base	16645 Saticoy St.	Van Nuys	CA	91406	562-806-5909	Public access; no restrictions
<a href="#">5</a>	16.947	CNG	City Of Thousand Oaks	1993 Rancho Conejo Blvd.	Thousand Oaks	CA	91320	No Data	Public with restrictions; card key required
<a href="#">6</a>	17.815	CNG	SoCal Gas - Santa Monica Base	1701 Stewart St.	Santa Monica	CA	90404	562-806-5909	Public access; no restrictions
<a href="#">7</a>	17.836	CNG	City of Santa Monica	2500 Michigan Ave.	Santa Monica	CA	90404	No Data	Private Station; limited access
<a href="#">8</a>	18.277	CNG	G.T.E.	2943 Exposition Blvd.	Santa Monica	CA	90404	No Data	Private Station; limited access
<a href="#">9</a>	18.872	CNG	UCLA	741 Charles Young Dr. S.	Los Angeles	CA	90095	562-806-5909	Public access; no restrictions
<a href="#">10</a>	21.448	CNG	20th Century Fox Studio	10201 W. Pico Blvd.	Los Angeles	CA	90064	No Data	Private Station; limited access

**Notes:**

1. Index numbers originally linked to U. S. Department of Energy website with further information. Location is [http://www.afdc.doe.gov/refueling\\_mapsite.html](http://www.afdc.doe.gov/refueling_mapsite.html).
2. LNG sites not listed since none available within reasonable distance. Nearest is at LAX, 25 miles from the shuttle route.

\*Distance from Malibu Creek State Park, 1925 Las Virgenes Rd., Calabasas, CA 91302

**APPENDIX B**

**CAPITAL COST OF ROLLING STOCK AND ITS ANNUALIZATION**

**ASSUMPTIONS**

Vehicle Life Expectancy	10 years
Salvage Value	\$0
Interest Rate for Capital Recovery Factor	7%
Capital Recovery Factor	0.1424

**CAPITAL COST PER VEHICLE**

**ANNUAL EQUIVALENT COST**

\$120,000	\$17,088
\$150,000	\$21,360
\$180,000	\$25,632
\$210,000	\$29,904

**SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA**

**TRANSIT OPERATIONS PLAN  
SHUTTLE SYSTEM DEMONSTRATION PHASE**

**Explanation of Spreadsheet Analysis of Costs, Ridership, and Revenues**

This memo accompanies the workbook named “NPS-SM Bus Services.xls”. It explains the derivation of the results, spreadsheet by spreadsheet.

**Ridership, Revenues, and Remaining Shortfall (Tab “Ridership v1 and Ridership v2”)**

These sheets summarize the workbook results. Ridership is estimated using the methodology presented in the 2000 Transportation Plan for the SMMNRA (2000 Plan), with modifications in assumptions as described below. Revenues are based on an assumed distribution of ridership by type of fare paid, using the fare structure agreed to by Dana Heiberg and Dave Miller in a telephone conversation on or about March 5, 2002. Funding needs and potential schemes for addressing the projected shortfall are analyzed using three alternate assumptions about relative shares borne by the participating agencies.

Estimated Shuttle Ridership

The table is driven by the “size of the visitor market” total of 548,306. This total represents the number of estimated weekend visitors as presented in the 2000 Plan. They are distributed according to the percentage likelihood of using the shuttle, based on the visitor survey results in the 2000 Plan. The segments are then scaled down following the initial distribution according to several adjustment factors. These are also as stated in the 2000 Plan, with the exception of the Shuttle Fare factor, which we have provided on the basis of the elasticity information in the Transportation Research Board (TRB) Handbook, “Traveler Response to Transportation System Changes.” In Ridership v1, the resulting total number of annual shuttle riders is 23,492. In Ridership v2, the System Coverage factor (reduction in tripmaking in the 2000 Plan attributed to the fact that the shuttle would not serve all the places to which park visitors might wish to travel) was increased from 0.5 to 0.65, to analyze a somewhat more optimistic scenario. In this more optimistic scenario, it is implicitly assumed that people interviewed at the sites that will be served are more likely to want to go to other sites than the 50% scaling-back implies. Based on this assumption, the resultant revised annual ridership for v2 is thus 30,359.

Estimated Fare Revenues

Fare revenues are estimated based on a fare structure in which children under 49 inches in height ride free (using a height standard eliminates disputes and the invitation to fraud that typically accompany an age standard). A single-trip fare of two dollars, with no discount for a round trip, is charged all other passengers except those who purchase a five dollar pass valid for an entire day. The table presents the assumed distribution of fares paid by category, assumes that adults not buying a day pass will ride round trip, and calculates the resulting total fare revenue, which comes to \$100,779 for the Ridership v2 assumptions (\$77,522 for Ridership v1).

## *Transit Operations Plan*

### Estimated Funding Needs

The expenses for this table are replicated from the sheet named “Annual Costs” and their derivation will be described under that heading. They are broken out into the [assumed] amount paid the contractor and the amount paid by NPS directly for expenses and/or staff costs.

Fare revenues are picked up from the table above, and three options for cost sharing are presented. In Option A, the difference between the amount paid the contractor and the amount of farebox revenue collected is assumed to be shared equally among the NPS, California State Parks, and Los Angeles County (possibly through the Beaches and Harbors Division), with NPS additionally absorbing its direct costs without assistance. This approach imposes the highest burden on NPS, but at least establishes a framework of cooperation among the three agencies. The potential for congestion relief at and near beach parking lots should be worth something to the state and the county, and they both contribute a nominal amount and share at least some of the uncertainty about revenues with NPS.

In Option B, NPS absorbs its own direct costs, while the difference between the farebox revenue and the contractor’s charges is shared equally between the state and the county. NPS still pays a larger share of the total shortfall, but is not subject to the risks of revenue fluctuation. In Option C, the entire shortfall is shared equally among the three parties. This is in some ways the most equitable approach, but could potentially create problems for the state or the county if it is unacceptable or prohibited for those agencies to (in effect) pay the federal government for services provided. One would hope, however, that an Interagency Memorandum of Understanding with appropriate terms could be developed and executed by all parties.

The calculated recovery ratio ranges from 53.2% with the most optimistic revenue projection, and looking only at O&M contractor charges, to 31.1%, with the more conservative revenue estimate, including NPS costs, as well as contractor charges.

### **Annual Service Levels and O&M Costs**

This spreadsheet develops the annual vehicle-hours of service, based on the agreed-on days and hours of operation, by season. Underlying detail about hours per vehicle per day is derived from the “Timetable” and the “Daily Service” sheets, indicating the planned scheduled hours and amount of service provided. The rationale for the schedule is presented in the Transit Operations Plan.

Annual O&M Cost is then estimated based on an hourly rate of \$43. The derivation of the \$43 figure is presented in the sheet titled “Unit Cost.” It is based on averaged FY 1999 reported costs for demand-responsive services provided by a number of Los Angeles area transit agencies, adjusted for inflation to 2002. Demand-responsive services are typically contractor-operated and use small buses or vans, making their per-hour costs more like what the park shuttle would experience than simply comparing with, for example, MTA or Santa Monica Municipal Bus Line costs. The estimate does not include capital costs, nor a nominal amount reflecting costs for administrative functions usually handled by the transit operator (which will be performed by NPS staff in this situation).

The resulting annual O&M cost is estimated at \$189,415, which is transferred to the Ridership summary sheet.

## ***Heart-of-the-Park Shuttle***

SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA

### **Annual Service Levels & O&M Costs**

#### **Annual Service Days**

	Peak Season	Off-peak Season
Holidays	3	0
Weekend Days	52	52
<b>TOTAL</b>	<b>55</b>	<b>52</b>

#### **Annual Vehicle-Hours**

	Peak Season	Off-peak Season	TOTAL
Daily Veh-Hours	47	35	
Service Days per Year	55	52	
<b>Annual Veh-Hours</b>	<b>2,585</b>	<b>1,820</b>	<b>4,405</b>

#### **Annual Operating & Maintenance Cost**

	Peak Season	Off-peak Season	TOTAL
Annual Veh-Hours	2,585	1,820	4,405
Rate per Veh-Hour	\$ 43.00	\$ 43.00	\$ 43.00
<b>Annual Cost</b>	<b>\$ 111,155</b>	<b>\$ 78,260</b>	<b>\$ 189,415</b>

#### **Annual Total Costs**

	Peak Season	Off-peak Season	TOTAL
Bus Operations/Maint.	\$ 111,155	\$ 78,260	\$ 189,415
Admin. Staff - Salary	\$ 25,000	\$ 25,000	\$ 50,000
Other Overhead	\$ 5,000	\$ 5,000	\$ 10,000
<b>Annual Cost</b>	<b>\$ 141,155</b>	<b>\$ 108,260</b>	<b>\$ 249,415</b>

## ***Heart-of-the-Park Shuttle***

SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA

### **Daily Service Levels**

#### ***PEAK SEASON***

##### **Bus 1**

	<u>Time</u>	
Pull-out	8:30 AM	
Begin Service	9:00 AM	
End Service	8:45 PM	
Pull-in	9:15 PM	
Total	12.75 Hours	

##### **Bus 2**

	<u>Time</u>	
Pull-out	9:30 AM	
Begin Service	10:00 AM	
End Service	7:45 PM	
Pull-in	8:15 PM	
Total	10.75 Hours	

##### **Bus 3**

	<u>Time</u>	
Pull-out	8:53 AM	
Begin Service	9:23 AM	
End Service	9:08 PM	
Pull-in	9:38 PM	
Total	12.75 Hours	

##### **Bus 4**

	<u>Time</u>	
Pull-out	9:53 AM	
Begin Service	10:23 AM	
End Service	8:08 PM	
Pull-in	8:38 PM	
Total	10.75 Hours	

**Grand Total: 47.0 Hours per day**

#### ***OFF-SEASON***

##### **Bus 1**

	<u>Time</u>	
Pull-out	8:30 AM	
Begin Service	9:00 AM	
End Service	4:45 PM	
Pull-in	5:15 PM	
Total	8.75 Hours	

##### **Bus 2**

	<u>Time</u>	
Pull-out	9:30 AM	
Begin Service	10:00 AM	
End Service	5:45 PM	
Pull-in	6:15 PM	
Total	8.75 Hours	

##### **Bus 3**

	<u>Time</u>	
Pull-out	8:53 AM	
Begin Service	9:23 AM	
End Service	5:08 PM	
Pull-in	5:38 PM	
Total	8.75 Hours	

##### **Bus 4**

	<u>Time</u>	
Pull-out	9:53 AM	
Begin Service	10:23 AM	
End Service	6:08 PM	
Pull-in	6:38 PM	
Total	8.75 Hours	

**Grand Total: 35.0 Hours per day**

## Heart-of-the-Park Shuttle

SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA

### WEEKENDS AND HOLIDAYS

#### CLOCKWISE

### Departure Times

Read Down ↓	ALL YEAR								SPRING & SUMMER ONLY		
	Bus 1	Bus 2	Bus 1	Bus 2	Bus 1	Bus 2	Bus 1	Bus 2	Bus 1	Bus 2	Bus 1
	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Malibu Creek State Park	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00
Tapia Park	9:07	10:07	11:07	12:07	1:07	2:07	3:07	4:07	5:07	6:07	7:07
Malibu Lagoon	9:18	10:18	11:18	12:18	1:18	2:18	3:18	4:18	5:18	6:18	7:18
Solstice Canyon	9:33	10:33	11:33	12:33	1:33	2:33	3:33	4:33	5:33	6:33	7:33
Zuma Lagoon	9:47	10:47	11:47	12:47	1:47	2:47	3:47	4:47	5:47	6:47	7:47
Westward Beach	9:52	10:52	11:52	12:52	1:52	2:52	3:52	4:52	5:52	6:52	7:52
Backbone Trailhead	10:09	11:09	12:09	1:09	2:09	3:09	4:09	5:09	6:09	7:09	8:09
Rocky Oaks	10:15	11:15	12:15	1:15	2:15	3:15	4:15	5:15	6:15	7:15	8:15
Peter Strauss Ranch	10:24	11:24	12:24	1:24	2:24	3:24	4:24	5:24	6:24	7:24	8:24
Paramount Ranch	10:33	11:33	12:33	1:33	2:33	3:33	4:33	5:33	6:33	7:33	8:33
Arrive Malibu Creek State Park	10:45	11:45	12:45	1:45	2:45	3:45	4:45	5:45	6:45	7:45	8:45

\* - Major stops / timepoints are listed. There are several additional minor stops.

### WEEKENDS AND HOLIDAYS

#### COUNTER-CLOCKWISE

### Departure Times

Read Down ↓	ALL YEAR								SPRING & SUMMER ONLY		
	Bus 3	Bus 4	Bus 3	Bus 4	Bus 3	Bus 4	Bus 3	Bus 4	Bus 3	Bus 4	Bus 3
	A.M.	A.M.	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
Malibu Creek State Park	9:23	10:23	11:23	12:23	1:23	2:23	3:23	4:23	5:23	6:23	7:23
Paramount Ranch	9:37	10:37	11:37	12:37	1:37	2:37	3:37	4:37	5:37	6:37	7:37
Peter Strauss Ranch	9:46	10:46	11:46	12:46	1:46	2:46	3:46	4:46	5:46	6:46	7:46
Rocky Oaks	9:55	10:55	11:55	12:55	1:55	2:55	3:55	4:55	5:55	6:55	7:55
Backbone Trailhead	10:01	11:01	12:01	1:01	2:01	3:01	4:01	5:01	6:01	7:01	8:01
Westward Beach	10:18	11:18	12:18	1:18	2:18	3:18	4:18	5:18	6:18	7:18	8:18
Zuma Lagoon	10:23	11:23	12:23	1:23	2:23	3:23	4:23	5:23	6:23	7:23	8:23
Solstice Canyon	10:37	11:37	12:37	1:37	2:37	3:37	4:37	5:37	6:37	7:37	8:37
Malibu Lagoon	10:47	11:47	12:47	1:47	2:47	3:47	4:47	5:47	6:47	7:47	8:47
Tapia Park	11:03	12:03	13:03	2:03	3:03	4:03	5:03	6:03	7:03	8:03	9:03
Arrive Malibu Creek State Park	11:08	12:08	13:08	2:08	3:08	4:08	5:08	6:08	7:08	8:08	9:08

\* - Major stops / timepoints are listed. There are several additional minor stops.

PARSONS

BRINCKERHOFF

000-Tech App B-NPS-SM Bus Services, Timetable

3/08/02 Version Printed 4/6/02

Heart-of-the-Park Shuttle
SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA

	Annual O&M Cost	Rev-Veh- Miles	Rev-Veh- Hours	Annual Trips	Daily Trips	Peak Vehicles	Fleet Size	Cost per Rev- Veh-Mile	Cost per Rev- Veh-Hour	Cost per Peak Vehicle	MPH	Trips per Rev- Veh-Mile	Trips per Rev- Veh-Hour	Spare Ratio
Montbello Bus Lines	\$337,027	61,604	6,246	20,377	72	3	5	\$5.47	\$53.96	\$ 112,342	9.9	0.33	3.26	66.7%
Santa Monica Municipal Bus Lines	\$386,706	63,863	7,590	20,938	72	4	5	\$6.06	\$50.95	\$ 96,677	8.4	0.33	2.76	25.0%
Norwalk Transit System	\$539,956	72,341	6,745	27,850	94	3	4	\$7.46	\$80.05	\$ 179,985	10.7	0.38	4.13	33.3%
City of Torrance Transit System (MAX)	\$1,040,910	232,471	20,605	94,948	311	30	56	\$4.48	\$50.52	\$ 34,697	11.3	0.41	4.61	86.7%
Santa Clarita	\$1,907,463	392,278	24,018	71,192	255	11	13	\$4.86	\$79.42	\$ 173,406	16.3	0.18	2.96	18.2%
LACMTA - Small Operators	\$7,210,517	2,077,023	154,790	746,073	2,369	116	145	\$3.47	\$46.58	\$ 62,160	13.4	0.36	4.82	25.0%
DAVE - Laidlaw Transit Service, Inc.	\$4,324,989	2,345,986	164,836	398,658	1,495	88	95	\$1.84	\$26.24	\$ 49,148	14.2	0.17	2.42	8.0%
LADOT	\$8,703,890	3,640,212	264,317	1,041,637	3,302	116	131	\$2.39	\$32.93	\$ 75,034	13.8	0.29	3.94	12.9%
Access Services Incorporated	\$35,723,000	13,707,306	523,566	1,571,002	4,939	302	336	\$2.61	\$68.23	\$ 118,288	26.2	0.11	3.00	11.3%

Note: Italics indicate questionable data.

Inflation Factor (1999 --> 2002):	1.0895							Averages of Above, excluding Norwalk						
	Annual O&M Cost	Rev-Veh- Miles	Rev-Veh- Hours	Annual Trips	Daily Trips	Peak Vehicles	Fleet Size	Cost per Rev- Veh-Mile	Cost per Rev- Veh-Hour	Cost per Peak Vehicle	MPH	Trips per Rev- Veh-Mile	Trips per Rev- Veh-Hour	Spare Ratio
NPS - Santa Monica NRA (1999 Dollars)	\$228,921		4,405	20,400	191	4	5	\$4.29	\$51.10	\$ 57,230	11.9	#DIV/0!	4.63	25%
NPS - Santa Monica NRA (2002 Dollars)	\$249,415		4,405	20,400	191	4	5	\$4.68	\$55.68	\$ 62,354	11.9	#DIV/0!	4.63	25%

Minus: Vehicles \$10.00
Admin \$2.00
Result: \$43.68